



THERMOMETRIC,

BAROMETRIC,

AND OTHER TABLES,

FOR THE

THE SCALES IN MORE FREQUENT USE.

CALCULATED BY

GEORGE ATKIN, Esq.

EXTRACTED FROM THE EDINBURGH NEW PHILOSOPHICAL JOHRNAT

ADAM & CHARLES BLACK, EDINBURGH.

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Thermometric Tables; Barometric Tables; Tables of Toises, French Feet and Inches, Metres and Millimetres; Tables of English Feet and Inches. Calculated by George Atkin, Esq.

THERMOMETRIC TABLES, Nos. I. II. III.

The following Tables are for the purpose of converting the degrees of the three thermometric scales into one another. When the quantity to be converted is a whole number, its value is ascertained by simple inspection of that table in which the proposed scale stands in the first column. Thus, to convert + 85 R. into degrees of Fahrenheit and Centigrade, by Table I. we find:

$$+$$
 85 R. $=$ 223.25 F. and 106.25 C.

Again, if -65 C. were the given number, we find in Table II. -65 C. = -85.0 F. and -52.0 R.

Lastly, to convert + 42 F. into the corresponding scales, in Table III. we find:

$$+42 \text{ F.} = +4.44 \text{ R.}$$
 and $+5.55 \text{ C.}$

If there be fractional parts annexed to the proposed number, by having recourse to the table of proportional parts, the value of the part is ascertained, and must be added to the number found in the body of the table; observing that, when the signs are alike, the sum is taken when unlike the difference. The signs of the fractional parts are the same in all the scales.

Example.

1. Convert + 44.2 R. into degrees of Fahr. and Cent.:

By Table I.
$$+44 \text{ R.} = +131.00 \text{ F.} +55.00 \text{ C.}$$

 $+0.2 = 0.45 = 0.25$
 $-44.2 \text{ R.} = 131.45 \text{ F.} = 55.25 \text{ C.}$

2. Convert -40.4 R. into degrees of Fahr. and Cent.:

$$\begin{array}{rcl} -40 \text{ R.} & = -58.00 \text{ F.} & -50.00 \text{ C.} \\ -0.4 & = -0.9 & -0.5 \\ \hline -40.4 \text{ R.} & = -58.9 \text{ F.} & -50.5 \text{ C.} \end{array}$$

If the proposed quantity extends to hundredths or thousandths of a degree, it may be converted by shifting the decimal point of the proportional part either one or two places to the left. For example:

4. Convert + 52.246 C. into degrees of Fahr. and Reaum.: + 52 C. = 125.6 F. 41.6 R. + 0.2 = 0.36 0.16 + 0.04 = 0.072 0.032 + 0.006 = 0.0108 0.0048 + 52.246 C. = 126.0428 F. 41.7968 R.

BAROMETRIC TABLES, Nos. IV. VI.

1. Required the value in French inches and lines, and English inches, of a column of mercury 729.7 mill. in height. By Table IV.

Tables V. and VI. are used in the same manner, and serve for the conversion of French inches and lines and English inches into one another, and also into millimetres. By these tables a conversion may be made at a half or third of any of the numbers, by doubling or trebling the given quantity, and then a half or third of the result will be the quantity required.

TABLES VII. to XIV.

Are for converting the different French and English measures into one another, and are used in the same manner as the preceding.

TABLE 1.

	1	1	18			1)	1		- 0		
Rea	-	Cent.	Reau	Fahr.	Cent.	Rea	u Fahr.	Cent	. Re	au. Fahr	. Cent.
-60				+34.2		5 +6			50 + 1		75 + 153.7
59			5 2	36.5	$0 \mid 2.50$		3 173.			24 311.	$00 \mid 155.00$
58 57			3	38.7					$00 \parallel 1$	25 313.	
56			5	41.0		$\begin{bmatrix} 6 \\ 6 \end{bmatrix}$		25 81.	25 1	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	50 157.50
55		68.75	6	45.50		$\frac{1}{6}$		50 82. 75 83.	75 1	$\begin{vmatrix} 27 & 317.7 \\ 28 & 320.6 \end{vmatrix}$	
54	89.50		7	47.78				00 85.		$\begin{bmatrix} 28 & 320.0 \\ 29 & 322.2 \end{bmatrix}$	
53	87.25		8	50.00						$\begin{bmatrix} 322.2 \\ 30 \end{bmatrix} \begin{bmatrix} 324.5 \\ 324.5 \end{bmatrix}$	
52	85.00	65.00		52.2				87.			5 163.75
51	82.75	63.75	10	54.50	12.50	7	1 191.7	5 88.7	5 1	32 329.0	0 165.00
50				56.78			$2 \mid 194.0$	0 90.0	00 13		5 166.25
49				59.00		73		$5 \mid 91.2$	25 13		0 167.50
$\begin{array}{c} 48 \\ 47 \end{array}$				61.25	16.25	74	198.5		0 13	35 335.7	5 168.75
46	73.75		14 15	63.50		75	200.7	5 93.7	5 13		
45	69.25	56.25	16	65.75 68.00		76			$\begin{bmatrix} 0 & 13 \\ 12 & 13 \end{bmatrix}$		
44	67.00	55.00	17	70.25		78	$\frac{205.2}{207.5}$		$ \begin{vmatrix} 5 & 13 \\ 0 & 13 \end{vmatrix} $		
43	64.75	53.75	18	72.50	22.50	79			$\begin{bmatrix} 1 \\ 5 \end{bmatrix}$		$\begin{bmatrix} 5 & 173.75 \\ 0 & 175.00 \end{bmatrix}$
42	62.50	52.50	19	74.75	23.75	80			0 14		5 176.25
41	60.25	51.25	20	77.00	$\int 25.00$	81	214.28	$5 \mid 101.2$	5 14	2 351.50	
40	53.00	50.00	21	79.25	26,25	82	216.50	102.5	0 14		
39 38	55.75	48.75	22	81.50	27.50	83			5 14	4 356.00	180.00
37	53.50 51.25	47.50 46.25	23	83.75	23.75	84					
36	49.00	45.00	$\begin{array}{ c c c c c }\hline & 24 \\ 25 \\ \end{array}$	86.00 83.25	30.03	85 86					182,50
35	46.75	43.75	26	90.50	32,50	87	225.50 227.75				183.75
34	44.50	42.50	27	92.75	33.75	88	230.00	108.7, 110, 00			
33	42.25	41.25	23	95.00	35.00	89	232.25	111.2			186.25 187.50
32	40.00	40.00	29	97.25	36.25	90	234.50	112.50	15		188.75
31	37.75	33.75	30	99.50	37.50	91	236.75	113.78	153	374.00	190.00
$\frac{30}{29}$	35.50	37.50	31	101.75	33.75	92	239.00	115.00	158		191.25
$\frac{29}{28}$	33.25 31.00	$36.25 \\ 35.00$	32	104.00	40.00	93	241.25		354	378.50	192.50
27	28.75	33.75	33 34	106.25 108.50	41.25 42.50	94 95	243.50	117.50	155		193.75
26	26.50	32.50	35	110.75	43.75	96	245.75		156		195.00
25	24.25	31.25	36	113.00	45.00	97	$248.00 \\ 250.25$		157		196.25
24	22.00	30.00	37	115.25	46.25	93	252,50	121.25 122.50	$\begin{vmatrix} 158 \\ 159 \end{vmatrix}$		197.50 198.75
23	19.75	28.75	38	117.50	47.50	99	254.75	123.75	160		200.00
22	17.50	27.50	39	119.75	48.75	100	257.00	125.00	161	394.25	201.25
21 20	15.25 13.00	$26.25 \\ 25.00$	40	122.00	50.00	101	259.25	126.25	162		202.50
19	10.75	23.75	41	124.25	51.25	102	261.50	127.50	163	398.75	203.75
18	8.50	22.50	42 43	$126.50 \mid 128.75 \mid$	52.50	$\begin{array}{c c} 103 \\ 104 \end{array}$	263.75	128.75	+164	+401.00	+205.00
17	6.25	21.25	44	131.00	53.75 55.00	104	266.00 268.25	130.00 131.25			
16	4.00	20.00	4.5	133.25	56.25	106	270.50	131.25 132.50			
15	-1.75	18.75	46	135.50	57.50	107	272.75	133.75	PRO	PORTIONAL	PARTS.
14	+ 0.50	17.50	47	137.75	58.75	108	275.00	135.00			
$\begin{vmatrix} 13 \\ 12 \end{vmatrix}$	2.75	16.25	48	140.00	60.00	109	277.25	136.25	Reau.	Fahr.	Cent.
11	$\frac{5.00}{7.25}$	$\begin{vmatrix} 15.00 \\ 13.75 \end{vmatrix}$	49	142.25	61.25	110	279.50	137.50			
10	9.50	12.50	50 51	144.50 146.75	62.50	111	281.75	138.75	0.1	0.225	0.125
9	11.75	11.25		149,00	63.75 65.00	112 113	284.00	140.00	0.2	0.450	0.250
	14.00	10.00	53	151.25	66.25	114	286.25 288.50	141.25 142.50	0.3	0.675	0.375
8 7 6 5 4	16.25	8.75	54	153.50	67.50	115	290.75	142.50 143.75	$\begin{array}{ c c } 0.4 \\ 0.5 \end{array}$	$0.900 \\ 1.125$	$0.500 \\ 0.625$
6	18,50	7.50	55	155.75	68.75	116	293.00	145.75	0.6	1.125	$0.025 \\ 0.750$
2	20.75	6.25	56	158.00	70.00	117	295.25	146.25	0.7	1.575	0.750
3	$\begin{vmatrix} 23.00 \\ 25.25 \end{vmatrix}$	5.00		160.25	71.25	118	-297.50	147.50	0.8	1.800	1.000
3 2 - 1	27.50	$\begin{bmatrix} 3.75 \\ 2.50 \end{bmatrix}$	58 59	162.50	72.50	119	299.75	148.75	0.9	2.025	1.125
- 1		-1.25	60	164.75 167.00	73.75	120	302.00	150.00			
0	+32.00		+61 +		75.00 +76.25	121 + 122	304.25	151.25			
				- 50.20	1 10.20	1 122	+306.50	+102.50			

TABLE II.

		•			LAD.	lara L					
Cent.	Fahr.	Reaum.	Cent.	Fahr	Reaum.	Cent.	Fahr.	Reaum.	Cent.	Fahr.	Reaum
75	103.00	60.0	_2	+28.4	_ 1.6	+71	+159.8	+56.8			+115.2
74	101.2	59.2	1	30.2	$\begin{array}{c} 0.8 \\ 0.0 \end{array}$	72 73	161.6 163.4	57.6 58.4	145 146	$\begin{bmatrix} 293.0 \\ 294.8 \end{bmatrix}$	116.0
73 72	99.4 97.6	58.4 57.6	+ 1	$\frac{32.0}{33.8}$	+ 0.8	74	165.2	59.2	147	296.6	117.6
71	95.8	56.8	2	35.6	1.6	75	167.0	60.0	148	298.4	118.4
70	94.0	56.0	3	37.4	$\begin{bmatrix} 2.4 \\ 3.2 \end{bmatrix}$	76 77	168.8 170.6	$\begin{array}{c} 60.8 \\ 61.6 \end{array}$	149 150	$300.2 \\ 302.0$	$\frac{119.2}{120.0}$
69 68	92.2 90.4	55.2 54.4	4 5	39.2 41.0	4.0	78	172.4	62.4	151	303.8	120.8
67	88.6	53.6	6	42.8	4.8	79	174.2	63.2	152	205.6	121.6 122.4
66 65	86.8	52.8	7 8	44.6 46.4	$\begin{bmatrix} 5.6 \\ 6.4 \end{bmatrix}$	80 81	176.0 177.8	$\begin{array}{c} 64.0 \\ 64.8 \end{array}$	153 154	307.4 309.2	123.2
64	85.0 83.2	52.0 51.2	9	48.2	7.2	82	179 ?	65.6	155	311.0	124.0
63	81.4	50.4	10	50.0	8.0	83	181.4	$\begin{bmatrix} 66.4 \\ 67.2 \end{bmatrix}$	156	312.8 314.6	124.8 125.6
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	79.6 77.8	49.6 48.8	$\begin{vmatrix} 11 \\ 12 \end{vmatrix}$	51.8 53.6	8.8 9.6	84 85	183.2 185.0	68.0	157 158	316.4	126.4
60	76.0	48.0	13	55.4	10.4	86	186.8	68.8	159	318.2	127.2
59	74.2	47.2	14	57.2	$\frac{11.2}{12.0}$	87 88	188.6 190.4	$\begin{bmatrix} 69.6 \\ 70.4 \end{bmatrix}$	$\begin{vmatrix} 160 \\ 161 \end{vmatrix}$	320.0 321.8	$\frac{128.0}{128.8}$
58 57	72.4 70.6	46.4 45.6	15 16	59.0 60.8	12.8	89	192.2	71.2	162	323.6	129.6
56	68.8	44.8	17	62.6	13.6	90	194.0	72.0	163	325.4	130.4 131.2
55	67.0	44.0	18	$\begin{array}{c} 64.4 \\ 66.2 \end{array}$	$\frac{14.4}{15.2}$	91 92	195.8 197.6	72.8 73.6	164 165	$327.2 \\ 329.0$	132.0
54 53	$65.2 \\ 63.4$	43.2 42.4	19 20	68.0	16.0	93	199.4	74.4	166	330.8	132.8
52	61.6	41.6	21	69.8	16.8	94	201.2	75.2	167	332.6 334.4	133.6 134.4
51	59.8	40.8	22 23	71.6 73.4	$\begin{array}{c} 17.6 \\ 18.4 \end{array}$	95 96	203.0 204.8	76.0 76.8	168 169	336.2	135.2
50 49	58.0 56.2	$\frac{40.0}{39.2}$	24	75.2	19.2	97	206.6	77.6	170	338.0	136.0
48	54.4	38.4	25	77.0	20.0	98	208.4	78.4 79.2	171 172	339.8 341.6	136.8 137.6
47 46	52.6	37.6 36.8	$\frac{26}{27}$	78.8 80.6	$20.8 \\ 21.6$	100	$210.2 \\ 212.0$	80.0	173	343.4	138.4
45	50.8 49.0	36.0	28	82.4	22.4	101	213.8	80.8	174	345.2	139.2
44	47.2	35.2	29	84.2	23.2	102	215.6 217.4	$ \begin{array}{c c} 81.6 \\ 82.4 \end{array} $	175 176		140.0 140.8
43 42	45.4 43.6	34.4 33.6	30 31	86.0 87.8	$24.0 \\ 24.8$	103 104	219.2	83.2	177	350,6	141.6
41	41.8	32.8	32	89.6	25.6	105	221.0	84.0	178		142.4 143.2
40	40.0	32.0	33	91.4	$26.4 \\ 27.2$	$\frac{106}{107}$	222.8 224.6	84.8	179 180		141.0
39 38	38.2 36.4	31.2 30,4	34 35	93.2 95.0	28.0	108		86.4	181	357.8	144.8
37	34.6	29.6	36	96.8	28.8	109	228.2	87.2	182		145.6 146.4
36	32.8	28.8	37	98.6	29.6 30.4	110 111	230.0 231.8	88.8	183 184		147.2
35 34	$\begin{vmatrix} 31.0 \\ 29.2 \end{vmatrix}$	$28.0 \\ 27.2$	38 39	$100.4 \\ 102.2$	31.2	112	233.6	89.6	185	365.0	143.0
33	27.4	26.4	40	104.0	32.0	113	235,4	90.4	186 187	366.8 368.6	148.8
32	25.6	25.6	$\begin{vmatrix} 41\\42 \end{vmatrix}$	105.8 107.6	32.8 33.6	114 115	$\begin{vmatrix} 237.2 \\ 239.0 \end{vmatrix}$	91.2	188	370.4	150.4
31 30	23.8 22.0	24.8 24.0	43	109.4	34,4	116	240.8	92.8	189	372.2	151.2 152.0
29	20.2	23.2	4.4	111.2	35.2	117	242.6	93.6	$\begin{vmatrix} 190 \\ 191 \end{vmatrix}$		152.8
28 27	18.4	22.4 21.6	45 46	113.0 114.8	36.0 36.8	118		95.2	192	377.6	153.6
26	16.6	20.8	47	116.6	37.6	120	248.0	96.0	193		154.4 155.2
25	13.0	20.0	48	118.4	38.4	121 122	249.8 251.6	96.8	194 195		156.0
24 23	11.2	19.2	49 50	$\begin{vmatrix} 120.2 \\ 122.0 \end{vmatrix}$	40.0	123	253.4	98.4	196	384.8	156.8
23	7.6	17.6	51	123.8	40.8	124	255.2	99.2	$\begin{array}{c c} 197 \\ 198 \end{array}$		157.6 158.4
21	5.8	16.8	52	$\begin{vmatrix} 125.6 \\ 127.4 \end{vmatrix}$	41.6	125 126		100.0	190	390.2	159.2
20 19	4.0 2.2	16.0 15.2	53 54	127.4	43.2	127	260.6	101.6	200	392.0	160.0 160.8
18	0.4	14.4	55	131.0	41.0	128	262.4	$102.4 \\ 103.2$	201 202		161.6
17	+ 1.4	13.6	56	132.8	44.8	129 130		104.0	203	397.4	162.4
16 15	3.2 5.0	12.8	57 58	136.4	46.4	131	267.8	104.8	204		+164.0
14	6.8	11.2	59	138.2	47.2	132	2002	105.6 106.4		+401.0	-
13	8.6	10.4	60	140.0	48.8	133 134	273.2	107.2	13 RO	PORTIONA	1
12	10.4	8.8	62	143.6	49.6	135	275.0	108.0	Cent	. Fahr.	Reaum.
10	14.0	8.0	63	145.4	50.4 51.2	136		100.8	0.1	0.18	0.08
9 8	15.8	7.2 6.4	64 65	147.2	52.0	138	280.4	110.4	0.2	0.36	0.24
7	19.4	5.6	66	150.8	52.8	139		111.2	0,4	0.72	0.32,
6	21.2	4.8	67	152.6 154.4	53.6	140	285.8	112.8	0.6	1.08 1.26	0.48
5 4	$\frac{23.0}{24.8}$	$\frac{1}{3.2}$	69	156.2	57.2	14:	287.6	113.6	0.7	1.44	0.64
_3	+26.6	2.4	+70	+158.0	十56.0	1+143	+289.4	1+114.4	(1,0)	1.62	0.72

TABLE III.

Fahr.	Reaum.	Cent.	Fahr.	Reaum.	Cent.	Fabr.	Reaum.	Cent.	Fahr.	Reaum.	Cent.
-100	_58.66	73.33	35	29.77	_37.22	+30	0.88	-1.11	+95	+28.00	+35.00
99	58.22	72.77	34	29.33	36.66	$\frac{31}{32}$	$0.44 \\ 0.00$	$0.55 \\ 0.00$	96 97	28.44 28.88	35.55 36.11
98 97	57.77 57.33	$72.22 \\ 71.66$	33 32	28.88 28.44	$36.11 \\ 35.55$	33	+0.44	+0.55	98	29.33	36.66
96	56.88	71.11	31	28.00	35.00	34	0.88	1.11	99	29.77	37.22
95	56.44	70.55	30	27.55	34.44	35	1.33	1.66	100	30.22	37.77
94	56.00	70.00	29 28	$27.11 \\ 26.66$	33.88 33.33	36 37	$1.77 \\ 2.22$	$2.22 \\ 2.77$	$\begin{array}{c} 101 \\ 102 \end{array}$	30.66 31.11	38.33 38.88
$\frac{93}{92}$	55.55 55.11	69.44 68.88	27	26.22	32.77	38	2.66	3,33	103	31.55	39.44
91	54.66	68.33	26	25.77	32.22	39	3.11	3,88	104	32.00	40.00
90	54.22	67.77	25	25.33	31.66	40	3.55	4.44	105	$32,44 \\ 32,88$	40.55 41.11
89 88	53.77 53.33	67.22	$\begin{array}{c} 24 \\ 23 \end{array}$	$24.88 \\ 24.44$	$31.11 \\ 30.55$	$\begin{array}{c c} 41 \\ 42 \end{array}$	4.00 4.44	5.00 5.55	$\begin{array}{c c} 106 \\ 107 \end{array}$	33.33	41.66
87	52.88	66.11	22	24.00	30.00	43	4.88	6.11	108	33.77	42.22
86	52.44	65.55	21	23.55	29.44	44	5.33	6.66	109	34.22	42.77
85	52.00	65.00	20	$\begin{array}{c c} 23.11 \\ 22.66 \end{array}$	28,88	45	5.77	7.22	$\begin{array}{c} 110 \\ 111 \end{array}$	34.66 35.11	43.33
84 83	51.55 51.11	64.44	19 18	$\frac{22.00}{22.22}$	$28.33 \\ 27.77$	46 47	$\frac{6.22}{6.66}$	7.77 8.33	112	35.55	44.44
82	50.66	63.33	17	21.77	$\frac{27.22}{27.22}$	48	7.11	8.88	113	36.00	45.00
81	50.22	62.77	16	21.33	26.66	49	7.55	9.44	114	36.44	45.55
80	49.77	62.22	15 14	$20.88 \\ 20.44$	26.11	50	8.00	10.00	115	36.88 37.33	46.11 46.66
79 78	49.33 48.88	61.66 61.11	13	$20.44 \\ 20.00$	25,55 $25,00$	$\frac{51}{52}$	8.44 8.88	10.55	$\begin{array}{c c} 116 \\ 117 \end{array}$	37.77	47.22
77	48.44	60.55	12	19.55	24.44	53	9.33	11.66	118	38.22	47.77
76	48.00	60.00		19.11	23,88	54	9.77	12.22	119	38.66	48.33
75 74	47.55	59.44	10	18.66 18.22	23.33 22.77	55	$10.22 \\ 10.66$	12.77 13.33	120 121	39.11 39.55	48.88 49.44
73	47.11 46.66	58.88 58.33	8	17.77	$\frac{22.77}{22.22}$	56	11.11	13.88	121	40.00	50.00
72	46.22	57.77	7	17.33	21.66	58	11.55	14.44	123	40.44	50.55
71	45.77	57.22	6	16.88	21.11	59	12.00	15.00	124	40.88	51.11
70 69	45.33 44.88	56.66 56.11	5 4	$ \begin{array}{ c c c c } \hline 16.44 \\ 16.00 \end{array} $	$20.55 \\ 20.00$	$\begin{vmatrix} 60 \\ 61 \end{vmatrix}$	$12.44 \\ 12.88$	15.55 16.11	$\frac{125}{126}$	$41.33 \\ 41.77$	$51.66 \\ 52.22$
68	44.44	55.55	3	15.55	19.44	62	13.33	16.66	127	42.22	52.77
67	44.00	55.00	2	15.11	18.88	63	13.77	17.22	128	42.66	53.33
66	43.55	54.44	$-\frac{1}{0}$	14.66	18.33	64	14.22	17.77	129	43.11	53.88
$\begin{array}{c} 65 \\ 64 \end{array}$	43.11	53,88 53,33	+1	$14.22 \\ 13.77$	17.77 17.22	65	$14.66 \\ 15.11$	18.33 18.88	$\frac{130}{131}$	43.55 44.00	54.44 55.00
63	42.22	52.77	2	13,33	16.66	67	15.55	19.44	132	44.44	55.55
62	41.77	52.22	3	12.88	16.11	68	16.00	20.00	133	44.88	56.11
61 60	41.33	51.66 51,11	5	12.44 12.00	15.55 15.00	<u>59</u>	16,44	20.55 21.11	134 135	45.33 45.77	$56.66 \\ 57.22$
59	40.44	50.55	6	11.55	14.44	$\begin{bmatrix} 70 \\ 71 \end{bmatrix}$	$16.88 \\ 17.33$	$\frac{21.11}{21.66}$	136	46.22	57.77
58	40.00	50.00	7	11.11	13.88	72	17.77	22.22	137	46.66	58.33
57 50	39.55	49,44	8	10.66	13.33	73	18.22	22.77	138	47.11	58.88
56 55	39.11 38.66	48.88 48.33	10	$\begin{bmatrix} 10.22 \\ 9.77 \end{bmatrix}$	12.77 12.22	74 75	18.66 19.11	23.33 23.88	$ \begin{array}{c c} 139 \\ 140 \end{array} $	47.55 48.00	$\begin{array}{c c} 59.44 \\ 60.00 \end{array}$
54	38.22	47.77	11	9.33	11.66	76	19.55	24.44	141	48.44	60.55
53	37.77	47.22	12	8.88	11.11	77	20.00	25.00	142	48.88	61.11
52 51	37.33 36.88	46.66 46.11	13 14	8.44 8.00	10.55 10.00	78	$20.44 \\ 20.88$	25.55	143 144	49.33	$61.66 \\ 62.22$
50	36,44	45.55	15	7.55	9.44	79 80	21.33	$ \begin{array}{c c} 26.11 \\ 26.66 \end{array} $	144	$49.77 \\ 50.22$	62.77
49	36.00	45.00	16	7.11	8,88	81	21.77	27.22	146	50.66	63.33
48 47	35.55	44.44	17	6,66	8.33	82	22.22	27.77	147	51.11	63.88
46	$\begin{vmatrix} 35.11 \\ 34.66 \end{vmatrix}$	43.88 43.33	18 19	$6.22 \\ 5.77$	$7.77 \\ 7.22$	83	22.66 23.11	28.33 28.88	$\begin{array}{c c} 148 \\ 149 \end{array}$	51.55 52.00	$64.44 \\ 65.00$
45	34.22	42.77	20	5.33	6.66	84 85	$\frac{23.11}{23.55}$	29.44	150	52.44	65,55
44	33.77	42.22	21	4.88	6.11	86	24.00	30.00	151	52.88	66.11
43 42	33.33	41.66	22 23	4.44	5.55	87	24.44	30.55	152	53, 33	66.66
41	32.44	$\frac{41.11}{40.55}$	$\frac{29}{24}$	3,55	$\begin{array}{c} 5.00 \\ 4.44 \end{array}$	88 89	24.88 25.33	$31.11 \\ 31.66$	$\begin{array}{c c} 153 \\ 154 \end{array}$	58,77 54,22	67.22 67.77
40	32.00	40.00	25	3.11	3.88	90	25.77	32,22	155	54.66	68.33
39 38	31.55	39.44	26	2.66	3.33	91	26,22	32.77	-156	55,11	68.88
37	30.66	38.88 38.33	27 28	$\frac{2.22}{1.77}$	$\frac{2.77}{2.22}$	$\begin{bmatrix} 92 \\ 93 \end{bmatrix}$	26.66 27.11	33.33 33.88	$\begin{array}{c} 157 \\ 158 \end{array}$	55,55 56,00	69.44 70.00
_ 36	_30.22	37.77	+29	_1.33	_1.66	+94	+27.55			+56.44	+70.55
-	-			-	-	LI CE COMMON					

TABLE III.—continued.

+160 +56.88 +71.11 +225 +85.77 +107.22 +290 +114.66 +143.33 -355 +143.55 +179. 162 57.77 72.22 227 86.66 108.33 292 115.55 114.44 356 144.00 130.0 163 58.22 72.77 228 67.11 108.83 293 116.00 145.00 358 144.40 130.0 164 58.66 73.33 299 87.55 109.44 294 116.44 145.55 359 145.33 181.0 165 59.11 73.88 230 88.00 110.00 295 116.88 146.11 360 145.77 182.2 167 60.00 75.00 232 88.88 111.11 297 117.77 147.22 302 146.66 183.3 169 60.44 75.55 233 89.33 111.66 293 118.22 147.77 362 146.66 183.3 170 61.33 76.66 235 90.22 112.77 300 119.11 148.83 365 148.00 185.0 172 62.22 77.77 237 91.11 183.83 302 120.00 150.00 367 148.88 186.1 174 63.11 78.88 239 9.2.00 115.00 304 120.08 150.00 367 148.88 186.1 175 63.55 79.44 240 92.44 115.55 305 121.33 151.66 370 149.77 187.2 176 64.04 80.00 241 92.88 116.11 366 121.77 152.22 371 150.66 183.3 176 64.88 81.11 243 93.77 117.22 308 122.66 153.33 373 151.55 189.4 177 64.44 80.55 79.44 240 92.44 115.55 305 121.33 151.66 370 150.02 167.7 176 64.00 80.00 241 92.88 116.11 366 121.77 152.22 371 150.66 183.3 166.66 244 94.22 117.77 309 123.11 153.83 374 152.00 190.00 180.00 376 152.28 170.00 190.00 183.66 68.44 85.55 242 93.33 116.60 307 122.22 152.77 372 151.11 183.83 310 122.24 155.55 305 121.33 151.66 370 150.22 167.7 187.2 245 93.33 116.66 307 122.22 152.77 372 151.11 183.83 310 122.22 152.77 372 151.11 183.83 310 122.22 152.77 372 151.11 183.83 310 122.22 152.77 372 151.11 183.83 310 122.22 152.77 372 151.11 183.83 310 122.22 152.77 372 151.11 183.83 310 122.22 152.77 372 151.11 183.83 310 122.22 152.77 372 151.11 183.83 310 122.22 152.77 372 151.11 183.83 310 122.22 152.77 372 151.11 183.83 310 122.22 152.77 372 151.11 183.83 310 122.22 152.77 372 151.11 183.83 310 122.66 153.33 374 152.00 190.00 133.11 153.83 374 152.00 190.00 133.11 153.83 374 152.00 190.00 133.11 153.83 374 152.00 190.00 133.11 153.83 374 152.00 190.00 133.11 153.83 374 152.00 190.00 133.11 153.83 374 152.00 190.00 133.11 153.83 310 160.00 195.00 313.12 124.44 155.55 314 125.33 156.66 158.33 310.16 150.00 376 152.24 190.5	Fahr	Reaum	. Cent.	Fahr.	Danne		11	1	1			
166				-	Reaum.	Cent.	Fahr.	Reaum.	Cent.	Fahr	Reaum	Cent.
163 55.277 72.22 927 86.66 60.333 929 115.55 144.44 367 14	16	1 57.33										
166			72.22	$2 \parallel -227$	86.66	108.33		115.11			0 (
166 59,15 74,44 231 38,68 110,60 296 117,33 18,16 166 167,7 167,20 167,60 298 38,48 111,11 297 117,77 147,22 302 146,66 136,3 169,60 60,88 76,11 234 39,77 112,22 299 118,66 148,33 364 147,57 182,24 170 61,37 77,72 236 90,22 112,77 300 119,11 148,38 365 149,00 183,0 172 62,66 77,77 237 91,11 113,83 301 119,55 149,44 36,66 148,33 38,33 117,60 61,60 77,77 27,72 236 90,22 111,60 296 119,11 148,38 365 149,00 183,0 172 62,66 77,77 237 91,11 113,83 301 119,55 149,44 36,66 148,33 366 148,00 183,0 173 62,66 79,44 240 92,44 115,55 305 212,33 151,66 370 150,22 177,7 177 64,44 30,55 242 93,33 116,66 20,77 177 64,44 30,55 242 93,33 116,60 307 122,22 132,77 372 151,11 183,17 176 64,43 30,60 244 92,83 116,61 306 121,77 152,22 371 150,66 133,33 130,10 10,66 133,33 373 151,66 130,33 374 152,00 150,00 376 148,88 186,11 179 63,33 31,66 64,44 30,55 242 93,33 116,66 307 122,22 152,77 372 151,11 183,88 36,14 30,50 30,60 244 94,22 117,77 309 123,11 153,18 374 152,00 160,00 376 148,88 186,11 366 148,33 310 123,55 154,44 375 182,44 105,55 376 31,40			1 1	228		108.83	293	116.00	145.00	35		
166 60,00 74,00 73,00 292 881,44 110,55 296 117,33 146,66 361 146,22 182,7 166 60,44 75,55 293 89,33 111,16 293 117,77 147,22 362 146,66 183,3 170,00 170,00 180,00	16	5 59.11	73.88					116.44				181 6
169 60.44 75.55 238 38.38 111.61 296 117.77 147.22 362 146.66 182.31 170 61.33 76.66 235 90.22 112.77 300 119.11 148.83 365 147.15 183.1 171 61.77 77.22 236 90.66 113.33 301 119.55 149.44 365 147.15 183.1 172 62.22 77.77 237 91.11 113.83 302 120.00 150.00 367 148.83 365 147.00 183.1 173 62.66 78.33 238 91.55 114.44 303 120.44 150.55 366 149.45 183.5 174 63.17 78.88 239 92.00 115.00 304 120.93 151.11 36.66 149.77 167.2 167.2 167.7 167.2 167.7 167.2 167.7 167.2 167.7 167.4 167.2 167.2 167.7 167.2 167.7 167.2 167.7 167.4 167.2 167.2 167.7 167.2 167.7 167.2 167.7 167.4 167.2 167.2 167.7 167.2 167.7 167.2 167.2 167.2 167.7 167.2 167.2 167.7 167.2 167.2 167.2 167.7 167.2 167.2 167.2 167.7 167.2 167.2 167.2 167.7 167.2 167.2 167.2 167.7 167.2 1		_	74.44	231	88.44	110.55		117.33				182.2
169 60.88 76.11 234 80.77 112.02 299 118.66 149.33 364 147.55 184.41 177 61.77 77.22 236 90.06 113.33 301 119.55 149.44 36.55 149.44 13.55 147.11 183.81 365 148.00 183.01 179 62.22 77.77 237 91.11 113.83 301 119.55 149.44 36.55 149.44 13.55 147.11 183.81 365 148.83 147.11 183.81 301 119.55 149.44 13.55 368 149.33 167.75 167.60 367 148.83 148.83 147.11 183.81 302 120.00 150.00 367 148.83 186.11 179 63.55 79.44 240 92.44 115.55 305 121.33 151.66 370 150.22 167.77 177.22 177 177.22 371 150.60 370 150.22 167.77 177.22 371 150.60 370 150.22 167.77 177.22 371 150.60 370 150.22 167.77 177.22 371 150.60 370 150.22 167.77 177.22 371 150.60 183.3 178 64.83 81.11 243 93.77 177.22 303 122.66 153.33 373 151.55 189.44 183.55 189.44 183.55 189.44 183.55 189.44 183.55 189.44 183.55 189.44 183.54 189.55 189.44 183.55 189.44 183.55 189.44 183.55 189.44 183.54 189.55 189.44 183.55 189.44 183.55 189.44 183.55 189.44 183.55 189.44 183.55 189.44 183.54 189.55 189.44 183.55 189.44 183.55 189.44 183.55 189.44 183.55 189.44 183.55 189.44 183.55 189.44 183.54 189.55 189.44 183.55			10.00	1)		111.11		117.77	147.22	362		183.3
177 61,77 77.22 236 90,92 112,77 300 119,11 148,18 365 148,00 163,00 177 62,92 277,77 237 91,11 113,83 301 119,55 149,44 366 148,44 366 148,44 366 148,44 366 148,44 366 148,44 366 148,44 367 177 177 174,44 368 120,64 150,55 368 149,33 361 174 63,15 79,44 240 92,44 115,55 305 121,33 151,66 370 150,22 371 150,66 181,33 176 64,48 36,51 44,48	16	9 60.88	76.11			111.66 112.22		118.22			147.11	183.88
172				235	90.22	112.77		119.11				
173 62,66 78,33 238 91,55 114,44 303 120,44 130,55 368 149,33 186,61 175 63,55 79,44 240 92,44 115,55 305 121,33 151,66 370 150,22 197,7 176 64,44 30,35 30,33 116,61 306 121,77 152,92 371 150,66 373 150,22 167,7 177 64,44 30,35 34,33 34,33 34,66 307 122,22 152,77 372 151,11 183,8 110,11 30,30 149,77 372 372 373 373 374 374 374 375 3	17:					113,33		119.55	149.44	366	148.44	185.53
174 63.15 78.88 239 92.00 115.00 150.65 304 120.66 130.31 151.11 369 149.77 187.25 176 64.00 30.00 241 92.48 116.11 306 121.77 152.29 371 150.66 188.31 176 64.48 31.11 243 93.77 117.22 308 122.66 153.33 373 151.55 189.4 179 65.33 31.66 244 94.22 117.77 309 123.11 153.88 374 152.00 190.00 181 66.22 82.77 246 95.11 118.83 311 124.00 155.00 376 152.24 190.51 181 66.62 83.33 247 95.55 1194.4 312 124.44 155.55 377 153.33 191.66 181.4 375 175.55 34.44 249 96.00 120.00 313 124.68 155.55 377 155.33 191.66 181.66 69.33 36.66 253 99.23 121.67 316 126.22 157.77 372 151.11 183.64 181.66 69.33 36.66 253 99.23 121.67 316 126.22 157.77 372 151.11 183.64 181.66 192.24 190.55 194.44 155.55 194.44 155.55 194.44 181.66 181.66 193.33 191.66 181.6	173	62.66						120.00				186.11
176 64.00 30.00 244 92.88 1161 306 121,77 152.92 371 150.66 183.3 176 64.44 80.55 242 93.33 116.66 307 122.22 152.77 372 151.11 183.81 179 65.33 61.66 244 94.22 117.77 309 123.15 153.38 373 151.55 189.4 180.65 180.66 183.3 310 123.55 154.44 375 152.40 190.51 180.66 66.62 83.33 247 95.55 119.44 312 124.40 155.50 376 152.88 191.14 190.51 180.66 66.60 63.33 247 95.55 119.44 312 124.44 155.55 377 153.33 191.66 183.64 191.66 183.64 191.66 183.64 191.66 183.64 191.66 183.64 191.66 183.64 191.66 183.64 191.66 183.64 191.66 183.64 191.66 183.64 191.66 183.64 191.66 183.64 191.66				239	92.00	-115.00	. 304	-120.88	151.11	369	149.33	
177	176	64.00				115.55		121.33	151.66	370	150.22	187.77
179 65.33 81.66 244 94.22 117.77 308 122.66 153.33 375 151.55 169.44 180.65 180 65.77 82.22 245 94.66 118.33 310 123.55 154.44 375 152.44 190.5 182 66.66 33.33 247 95.55 119.44 312 124.44 155.55 154.44 375 152.44 190.5 182 66.66 33.33 247 95.55 194.44 312 124.44 155.55 377 153.33 191.66 183.66 67.55 84.44 249 96.44 120.55 314 125.33 156.66 379 154.22 192.77 184 67.55 68.00 85.00 250 96.88 121.11 315 125.77 157.22 300 154.66 193.33 186 68.44 85.55 251 97.77 122.22 317 126.66 158.33 32 155.55 194.44 188 69.33 86.61 252 97.77 122.22 317 126.66 158.33 32 155.55 194.44 188 69.33 86.66 253 99.22 122.77 318 127.55 159.44 318 156.11 193.86 326 90.70 22 87.77 225 99.11 123.88 320 128.00 160.00 385 156.86 196.11 197.75 197.22 192.77 197.75 197.22 199.77 177.75 197.22 199.77 177.75 197.22 199.77 177.75 199.72 199.77 177.22 199.77 177.22 199.77 177.75 199.72 199.74 194.72 199.75 199.74 194.72 199.77 199.74 199.74 199.75 199.74 199.75 199.74 199.75 199.74 199.75 199.74 199.75 199.74 199.75 199.74 199.88 275 100.00 125.00 320 133.15 166.41 393 160.60 393 160.00 200.00 250 100.38 126.11 324 129.77 106.22 129.77 390 169.11 198.88 275 100.00 125.00 325 130.22 162.77 390 169.11 198.88 275 100.00 125.00 325 130.22 162.77 390 169.11 198.88 199.74 199.75 199.74 199.75 199.74 199.75 199.74 199.75 199.74 199.75 199.74 199.75 199.74 199.75 199.74 199.77 199.72 199.77 199.72 199.77 199.72 199.77 199.72 199.77 199.78 199.77 199.78 199.77 199.78 199.77 199.78 199.77 199.78 199.78 199.78 199.78 199.78 199.78 199.78 199.78 199.78 199.78 199.78 199.78	177	64.44	80.55			116.66		121.77	$\frac{152,22}{159.77}$		150.66	[-188.33]
160 65.77 82.92 244 94.92 117.77 309 123.15 153.08 374 152.00 190.00 181 66.22 82.77 246 95.11 118.88 311 124.00 155.00 376 152.88 191.11 183 67.15 33.83 247 95.55 119.44 312 124.44 155.55 377 153.23 191.15 183 67.15 33.83 248 96.00 120.00 313 124.88 156.11 376 152.83 191.15 183 67.15 38.84 249 96.44 120.55 314 125.33 156.66 379 154.22 192.77 185 68.00 85.00 250 96.88 121.11 315 125.77 157.22 316 68.44 85.55 251 97.33 121.66 316 126.22 157.77 381 155.11 193.37 186 69.33 66.66 253 99.22 122.77 318 127.11 158.88 33 156.55 194.44 319 96.77 70.22 87.77 255 99.11 123.88 320 128.00 160.00 385 156.83 196.16 193.37 190.07 190.00 250 100.00 125.00 322 128.00 160.00 385 156.83 196.16 193.37 170.66 88.33 256 99.55 124.44 321 128.44 160.55 366 157.33 196.66 193.37 170.15 193.47 192.22 128.04 160.65 366 157.33 196.66 193.37 170.15 193.47 193.48 193.47 193.48 193.47 193.47 193.47 193.47 193.47 193.47 193.47 193.47 193.47 193.47 193.47 193.47 193.47 193.4					93.77	117.22	308	122.66	-153.33	373	151.55	
181 66.22 82.77 246 95.11 118.86 311 124.00 155.00 376 152.86 191.11 183.83 67.11 83.83 244 95.55 119.44 312 124.44 155.55 377 153.33 191.06 184 67.55 84.44 249 96.44 120.55 314 125.33 156.66 379 154.22 192.77 186 68.00 85.00 250 96.88 121.11 315 125.77 157.22 330 154.66 193.33 181.06 187 68.80 68.81 68.11 252 97.77 122.22 317 126.66 158.33 332 155.55 194.44 189.05 189.06 189.07 189.06 189.07 189.06 189.07 189.06 189.07 18			82,22		94.22			123,11	-153.88	374	152.00	190.00
183 67.11 83.88 248 96.00 120.00 313 124.48 155.55 377 153.33 191.66 183 67.55 84.44 249 96.44 120.55 314 125.33 156.66 379 154.22 192.77 186 68.44 85.55 251 97.33 121.66 316 126.22 157.77 381 155.11 193.68 193.38 36.66 253 98.22 122.77 318 127.11 158.88 333 156.00 195.00 195.00 195.00 385 156.83 382 155.55 194.44 195.55 190.00 125.00 322 128.00 160.00 385 156.83 196.61 193.71 193.71 158.88 161.11 376 157.33 196.66 195.00		66,22	82.77	246	95.11	-118.881			155.00	375 376		190.55
184 67.55					95.55	-119.44	312	124.44	155.55	377	153.33	191.11
185 68.00	184	67.55				120.00		124.88	156.11	378	153.77	192.22
187 68.43 86.11 252 97.77 122.22 317 126.66 158.33 382 155.55 194.44 188 69.33 86.66 253 99.22 122.77 318 127.11 158.88 383 156.00 195.00 190 70.22 87.77 255 99.11 123.38 320 128.00 160.00 385 156.35 194.44 191 70.66 88.33 256 99.55 124.44 321 128.44 160.55 386 157.33 196.66 192 71.11 88.88 257 100.00 125.00 322 128.88 161.11 337 157.77 197.22 194 72.00 90.00 259 100.08 126.11 324 129.77 162.29 389 158.66 198.33 196 72.88 91.11 261 101.77 127.22 326 130.66 163.33 391 159.55 199.44 197 73.33 91.66 262 102.22 127.77 327 131.11 163.88 392 160.00 200.00 199 74.22 92.77 264 103.11 128.83 329 132.00 165.00 394 160.88 201.11 198 73.77 92.22 263 103.65 103.55 129.44 330 132.44 165.55 393 160.44 200 74.66 93.33 265 103.55 129.44 330 132.44 165.55 394 160.88 201.11 201 75.11 93.88 266 104.00 130.00 331 132.49 165.50 394 160.88 201.11 202 75.55 94.44 95.55 269 105.33 131.66 333 133.77 167.22 202 75.75 94.44 95.55 269 105.33 131.66 333 133.77 167.22 202 77.77 27.79 106.66 133.33 133.77 167.22 202 77.77 27.79 106.66 133.33 337 337.40 167.22 395 163.31 203.88 204 76.44 95.55 269 105.33 131.66 334 134.22 167.77 399 163.31 203.88 205 76.88 96.11 270 105.77 132.22 335 134.66 163.33 162.66 203.33 206 77.73 96.66 271 106.29 132.77 345 339 162.66 203.33 207 77.77 97.22 272 106.66 133.33 336.00 177.00 218 80.44 100.55 278 109.33 136.66 333 334 136.60 177.00 219 80.00 100.00 277 108.68 136.11 342 137.77 172.22 399 103.11 203.88 210 80.44 105.55 269 105.33 133.44 136.64 173.33 174.60 175.50 2			85.00	250		$-121.11 \parallel$		$\frac{125.33}{125.77}$			154.22 154.66	
188	186 187	68 89	85.55			121.66		126.22	157.77	381		193.88
189 69.77 87.22 254 98.66 123.33 319 127.15 159.44 334 156.44 195.55 197.77 197.92 197.77				f _ 1		122.22		126.66	158.33			194.44
191 70.66 88.33 256 99.55 124.44 321 128.44 160.55 336 157.33 196.66 193.71 193.88 257 100.00 125.00 322 128.86 161.11 337 157.77 197.22 195 72.44 90.55 260 101.33 126.66 325 130.33 161.66 338 158.22 197.77 195.72 195 72.44 90.55 260 101.33 126.66 325 130.66 163.33 391 159.55 199.44 197 73.33 91.66 262 102.22 127.77 326 130.66 163.33 392 160.00 120.00 199.11 198.88 326 102.26 123.33 328 131.15 164.44 333 160.46 200.55 199.44 200.55 200 74.22 92.77 264 103.11 128.83 329 132.00 165.00 39.44 200.55 200 75.11 93.88 265 104.00 130.00 331 132.88 166.11 396 161.77 202.22 203 75.55 94.44 267 104.44 130.55 332 133.33 166.66 39.33 39.1 30.66 201.11 30.66 39.83 266 104.00 130.00 331 132.88 166.11 396 161.77 202.22 202 75.55 94.44 267 106.22 132.77 336 135.55 166.83 397 162.22 202 77.73 95.55 209 105.33 131.66 334 134.22 167.77 399 163.11 20.388 77.77 77.77 77.77 27.3 107.11 133.88 337 135.55 140.44 170.55 200 77.77 27.3 107.11 133.88 338 136.04 170.55 200 79.11 93.88 274 107.55 134.44 339 136.44 170.55 200 79.11 93.88 274 107.55 134.44 33.93 136.04 170.55 170.00 170.			87.22		98.66	123.33		127.55	159.44		156.00	
192 71.11 88.88 257 100.00 125.00 322 128.88 161.11 387 157.77 197.92 194 72.00 90.00 259 100.88 126.11 324 129.77 162.22 389 158.66 198.38 195.72 196.72 197.72 197.92 326 130.22 162.77 390 159.11 198.88 197.73 39 159.11 198.88 391.11 261 101.77 127.22 326 130.66 163.33 391 159.55 199.44 198.78 77 92.22 263 102.66 123.33 328 131.55 164.44 393 160.44 200.55 199.44 165.55 395 161.33 201.66 101.77 127.22 101.75 10								128.00	160.00		156.88	-196.11
193	192	71.11						128,44	160.55			196.66
195 72.44 90.55 260 101.33 126.66 325 130.22 162.77 330 159.56 198.83 196 72.88 91.11 261 101.77 127.22 326 130.66 163.33 391 159.55 199.44 198 73.77 92.92 263 102.66 123.33 328 131.55 164.44 303 160.04 200.00 200.00 74.66 93.33 265 103.55 129.44 330 132.44 165.55 394 160.08 201.11 200 74.66 93.33 265 103.55 129.44 330 132.44 165.55 394 160.08 201.11 200 75.55 94.44 267 104.44 130.55 332 133.33 166.66 397 162.22 202.77 203 76.00 95.00 268 104.88 131.11 333 133.77 167.22 398 162.66 203.33 204 76.44 95.55 269 105.33 131.66 334 134.22 167.77 399 162.11 203.38 206 77.33 96.66 271 106.22 132.77 336 135.51 168.88 206 77.33 96.66 271 106.22 132.77 336 135.51 168.88 206 77.77 97.22 272 106.66 133.33 337 135.55 169.44 207 77.77 97.22 272 106.66 133.33 338 136.00 170.00 1				258	100.44	125.55	323	129.33	161.66		157.77 158.22	
196		72.44							162.22	389	158.66	198.33
197		72.88	91.11		101.77						159.11	
195		73.33 73.77			102,22	127.77		131,11	163.88	392	160.00	200.00
200		74.22	92.32 92.77			128.33 128.88		131.55	164.44			200.55
201			93.33	265	103.55	$129.44 \parallel$						201.11
203								132.88	166.11	396	161.77	202,22
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	203	76.00				131.11		133.33			162.22	
206 77.73 96.66 271 106.22 132.77 335 134.66 168.33 +400 +163.55 +204.44 207 77.77 97.22 272 106.66 133.33 337 135.55 169.44 208 78.22 97.77 273 107.11 133.83 339 136.40 170.00 210 79.11 98.88 275 108.00 135.00 340 136.88 171.11 211 79.55 99.44 276 108.44 135.55 341 137.33 171.66 212 80.00 100.00 277 108.68 136.11 342 137.77 172.22 213 80.44 100.55 278 109.33 136.66 343 133.22 172.77 214 80.88 101.11 279 109.77 137.22 341 138.66 138.33 173.33 215 81.33 101.66 230 110.22 137.77 345 139.11 173.88 216 81.77 102.22 281 110.66 138.33 346 139.55 174.44 217 82.22 102.77 282 111.11 138.88 347 140.00 175.50 218 82.66 103.33 283 11.55 139.44 140.65 349 140.88 176.11 220 83.55 104.44 285 112.44 140.55 287 113.33 141.66 352 142.22 177.77 222 84.44 105.55 287 113.33 141.66 352 142.22 177.77 223 34.83 106.11 268 113.77 142.22 353 142.66 178.33 35 134.66 168.33 168.88 168.88 135.11 168.88 135.11 168.88 135.11 169.44 170.00 37 37 37 37 37 37 37			95.55	269	105.33	$131.66 \parallel$	334	134.22	167.77			
207 77.77 97.22 272 106.66 133.33 337 135.55 169.44 170.00 170				270 271	105.77	132,22		134.66	168.33	+400	+ 163.55 -	F204.44
203	207	77.77	97.22	272	106.66	133.33	337	135.55	169.44			
210 79.11 98.88 275 108.00 135.50 340 136.88 171.11 171.65 212 80.00 100.00 277 108.68 136.11 342 137.77 172.22 214 80.88 101.11 279 109.77 137.22 344 138.66 173.33 173.83 173.83 173.83 101.66 230 110.22 137.77 345 139.11 173.83 17				273	107.11	133.88	338	136.00	170.00	Propo	RTIONAL I	PARTS.
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				274	107.55 108.00			136.44	170.55			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	211	79.55	99.44	276	108.44	135.55	341	137.33	$171.66 \pm$	Fahr.	Reaum.	Cent.
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				277	108.88	136.11	342	137.77	172.22	0.1	0.044	0.055
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			101.11		109.33	137.22		1 <i>3</i> 8,22 138,66	172.77 173 32	0.2	0.088	0.111
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	215		101.66	-280	110.22	$137.77 \ -$	345	139.11	173.88			0.166
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	216	89.00						139.55	174.44			0.222
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	218	82.66	103.33							0.6	0.266	0.333
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		83.11	$103.88 \parallel$	284	112.00	140.00	349	140,88	176.11			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	220				12.44				176.66			
223 84.88 106.11 288 113.77 142.22 353 142.66 178.33	222	81.44		287	13.33		352	142.22				
234 100.00 + 269 + 114.22 + 142.77 + 35 + 143.11 + 178.88	223			288 - 1	13.77	142.22	353	[42,66]	178.33			
	-24	10.00	100,66	- 289 [+]	14.22 -	142.77	551 +	H3.11 [+]	176.88			

TABLE IV.

Millin		French	French	English		1	French	F	rench		
	In.	Lines.	Lines.	inches.	Millim.	In.	Lines.		ines,		English inches.
720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743	26 26 27	7.17 7.62 8.06 8.50 8.95 9.39 9.83 10.28 10.72 11.16 10.05 0.49 0.94 1.38 1.82 2.27 2.71 3.15 3.60 4.04 4.48 4.93 5.37 5.81	319.17 319.62 320.06 320.50 320.95 321.39 321.83 322.28 322.72 323.16 324.05 324.05 324.94 325.38 325.62 326.27 326.71 327.15 327.16 328.04 328.04 328.93 329.37	28.347 28.386 28.426 28.465 28.504 28.544 28.583 28.623 28.662 28.701 28.741 28.780 28.819 28.859 28.898 28.937 29.016 29.056 29.095 29.134 29.174 29.213 29.252 29.292	759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780	28	0.46 0.90 1.35 1.79 2.23 2.68 3.12 3.56 4.01 4.45 4.89 5.34 5.78 6.22 6.67 7.11 7.55 8.00 8.44 8.88 9.33 9.77	33 33 33 33 33 34 34 34 34 34 34 34 34 3	36.46 36.90 37.35 37.79 38.23 38.68 9.12 9.56 0.01 0.45 0.89 1.34 1.78 2.22 2.27 3.11 3.55 4.00 4.44 4.48 5.33 5.77	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	29,882 29,922 29,96F 30,000 30,040 30,040 30,049 30,158 30,158 30,276 315 30,315 30,315 30,434 30,473 30,512 30,552 30,591 30,670 30,709
745 746 747		6.26 6.70 7.14	330.26 330.70	29.331 29.371			'ROPORTIO				
748 749		7.58 8.03	331.14 331.58 332.03	29,410 29,449 29,489	-	Millin	din	es.	Engl inch	es.	
750 751 752 753 754 755 756 757 758	27 28	8.47 8.91 9.36 9.80 10.24 10.69 11.13 11.57 0.02	332.47 332.91 333.36 333.80 334.24 334.69 335.13 335.57 336.02	29.489 29.528 29.567 29.607 29.646 29.725 29.764 29.804 29.804		0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9	0.00 0.11 0.11 0.22 0.22 0.3 0.30 0.40 0.44	90 35 30 25 70 15 05	0.003 .007 .011 .016 .018 ' .027 .027 .031 .035 0.039	78 18 57 96 36 75 4	

TABLE V.

Fre	ench	Fr.	English		Fre	nch	Fr.	Time No. 2				
In.	Lin.	Lin.	inches.	Millim.	In.	Lin.	Lin.	English inches.	Millim.	Prot	PORTIONAL 1	PARTS.
26 26 27	1 2 3 4 5 6 7 8 9 10 11 0 1 2 3 4 5 6	313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330	27.799 27.887 27.976 28.065 28.154 28.243 28.332 28.420 28.509 28.598 28.687 28.766 28.864 28.953 29.042 29.131 29.220 29.309	706.128 708.384 710.640 712.896 715.152 717.408 719.664 721.920 724.176 726.432 728.688 730.944 733.200 735.456 737.712 739.968 742.224 744.480	27 27 28 28 28	7 8 9 10 11 0 1 2 3 4 5 6 7 8 9 10 11 0 1 1 0 1 1 0 1 0 1 0 0 1 0 0 1 0 0 0 0 1 0	331 332 333 334 335 336 337 338 340 341 342 343 344 345 346 347 348	29.397 29.486 29.575 29.664 29.753 29.841 29.930 30.019 30.108 30.197 30.285 30.374 30.463 30.552 30.641 30.730 30.818 30.907	746.736 748.992 751.248 753.504 755.760 758.016 760.292 762.528 764.784 767.040 771.552 773.808 776.064 778.320 780.576 782.832 785.088	0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0	English inches. 0.0089 0.0178 0.0266 0.0355 0.0444 0.0533 0.0622 0.0710 0.0799 0.0838	Millim. 0.2256 0.4512 0.6768 0.9024 1.1280 1.3536 1.5792 1.8048 2.0304 2.2560

TABLE VI.

English	. Fr	ench	French	M;1111,2	English	Fi	rench	Frenc		Milli.n.
inches.	In.	Lines,	Lines.	1411,472	inches.	In.	Lines.	Lines		print.tt.
27.1 27.2 27.3 27.4 27.5 27.6 27.7 27.8 27.9 28.0 28.1 28.2	25 25 26	5.12 6.25 7.35 8.50 9.63 10.75 11.88 1.01 2.13 3.26 4.38 5.51	305.12 306.25 307.38 308.50 309.63 310.75 311.88 313.01 314.13 315.26 316.38 317.51	638.31 690.65 693.39 695.93 693.47 701.01 703.55 706.09 708.63 711.17 713.71 716.25	29.9 30.0 30.1 30.2 30.3 30.4 30.5 30.6 30.7 30.8 30.9 31.0	28 23 29	0.65 1.78 2.90 4.03 5.15 6.28 7.41 8.53 9.66 10.78 11.91 1.04	336.6 337.7 338.9 340.0 341.1 342.2 343.4 344.5 345.6 346.7 347.9 349.0	8 0 3 5 1 3 6 8 1	759,43 761,97 764,51 767,05 769,59 772,13 774,67 777,21 779,75 782,29 784,83 787,37
28.3 28.4 28.5 28.6		6.64 7.76 8.89 10.01	$ \begin{array}{r} 318.64 \\ 319.76 \\ 320.89 \\ 322.01 \end{array} $	$\begin{array}{c} 718.79 \\ 721.33 \\ 723.87 \\ 726.41 \end{array}$		PR	OPORTIO	NAL PAG	RTS.	
28.7 28.8 28.9 29.0 29.1 29.2 29.3 29.4 29.5 29.6 29.7 29.8	26 27 27	11.14 0.27 1.39 2.52 3.64 4.77 5.90 7.02 8.14 9.27 10.40 11.52	323.14 324.27 325.39 326.52 327.64 328.77 329.90 331.02 332.14 833.27 334.40 335.52	728.95 731.49 734.03 736.57 739.11 741.65 744.19 746.73 749.27 751.81 754.35 756.89	E	0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10	0. 0. 0. 0. 0. 0. 0. 0.	Lines. 1126 2252 3378 4504 5630 6755 7881 9007 0133 1259	0.3 0.3 0.4 1.0 1.3 1.3 2.0 2.1	10 10 10 10 10 10 10 10

TABLE VII.—Toises.

Toises.	Metres.	English Feet.	Toises.	Metres.	nglish Feet.
Toises. 1 2 3 4 5 6 7 8 9 10 29 30	Metres. 1.94904 3.89807 5.84711 7.79615 9.74518 11.69422 13.64325 15.59229 17.54133 19.49036 38.98073 53.47109	English Feet. 6.39459 12.78918 19.18377 25.57837 31.97296 38.36755 44.76214 51.15673 57.55132 63.94592 127.89183 191.83775	200 300 400 500 600 700 800 900 1000 2000 3000 4000	389,80726 584,71089 779,61452 974,51815 1169,42179 1364,32542 1559,22905 1754,13268 1949,03631 3898,07262 5847,10693 7796,14524	1278,91832 1818,37748 2557,83664 3197,29580 3836,75496 4476,21412 5115,67328 5755,13244 6394,59160 12789,18321 19183,77481 25578,36642
40 50 60 70 80 90 100	77.96145 97.45182 116.94218 136.43254 155.92290 175.41327 194.90363	225.78366 319.72958 363.67550 447.62141 541.56733 575.54324 639.45916	5000 6000 7000 8000 9000 10000	9745.18155 11694.21786 13643.25417 15592.29084 17541.32679 19490.36310	31972,95802 38367,54963 44762,14123 51156,73284 57551,32444 63945,91605

TABLE VIII.—FRENCH FEET.

French Feet.	Toises.	Metres.	a	lish Feet.	French Feet.	Toises.	Metres.	ลัก	Ish Feet
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100	0.16667 0.33333 0.50000 0.66667 0.83333 1.00000 1.16667 1.33333 1.50000 1.66667 3.33333 1.00000 1.166667 1.33333 1.00000 1.166667	$\begin{array}{c} 0.32484\\ 0.64968\\ 0.97452\\ 1.29936\\ 1.62420\\ 1.94904\\ 2.27338\\ 2.59872\\ 2.92355\\ 3.24859\\ 6.49679\\ 9.74518\\ 12.99358\\ 16.24197\\ 19.49036\\ 22.73876\\ 25.98715\\ 29.23554\\ 32.46394\\ \end{array}$	1 2 3 4 5 6 7 8 9 10 21 31 42 53 63 74 45 95 106	Inch. 0.7892 1.5784 2.3675 3.1567 3.9459 4.7351 5.5243 6.3135 7.1026 7.8918 3.7837 11.6755 7.5673 3.4592 11.3510 7.2428 3.1347 11.0265 6.9183	200 300 400 500 600 700 800 900 1000 2000 5000 6000 7000 8000 9000 10000	33.3333 50.00000 66.66667 83.33333 100.00000 116.66667 133.33333 150.00000 166.66667 333.33333 1000.00000 1166.66667 1333.33333 1500.00000 166.66667	64,96788 97,45182 129,93575 162,41969 194,90363 £27,38757 259,87151 292,35545 324,83938 649,67877 974,51815 1299,35754 1624,19692 1949,03631 2273,87569 2598,71508 2923,55446 3248,39385	213 319 426 532 639 746 852 959 1065 2131 3197 4263 5328 6394 7460 8526 9591 10657	1.8366 8.7550 3.6733 10.5916 5.5099 0.4282 7.3466 2.2649 9.1832 6.3664 3.5496 0.7328 9.9160 7.0993 4.2825 1.4657 10.6489 7.8321

TABLE IX.—French Inches.

French Inches.	Toises.	Millimeters.	English Inches
1	0.01389	27.070	1.0658
2	0.02778	54.140	2.1315
3	0.04167	81.210	3.1973
4	0.05556	108.280	4.2631
5	0.06941	135.350	5.3288
6	0.08333	162.420	6.3946
7	0.09722	189.490	7.4604
8	0.11111	216.560	8.5261
9	0.12500	243.630	9.5919
10	0.13839	270.699	10.6577
11	0.15278	297.769	11.7234
12	0.16667	324.839	12.7899

TABLE X.—FRENCH LINES.

2.22	0000	2	232212101
French Lines.	Toises.	Millimeters.	English Inches.
1	0.00116	2,256	0.0888
2	0.00231	4.512	0.1776
3	0.00347	6,767	0.2664
4	0.00463	9.023	0.3553
5	0.00579	11.279	0.4441
6	0.00694	13.535	0.5329
7	0.00810	15.791	0.6217
8	0.00926	18.046	0.7105
9	0.01042	20.302	0.7993
10	0.01157	22.558	0.8881
11	0.01273	24.814	0.9770
12 ·	0.01389	27.070	1.0658

TABLE XI.—METRES.

			Fren	ch	Е	nglish	Met.	Toise	F	'renc	h	Eng	glish
Met.	Toises.	Feet.	In.	Lines.	Feet.	Inch.	1,200.	1 Olse	Feet.	In.	Lines.	Feet.	Inch.
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80	0.51307 1.02615 1.53922 2.05230 2.56537 3.07844 3.59152 4.10459 4.61767 5.13074 10.26148 15.39222 20.52296 25.65370 30.78444 35.91519 41.04593	24 27 30 61 92 123 153 184 215	0 1 2 3 4 5 6 7 8 9 6 4 1 11 8 5 3	11.296 10.592 9.868 9.184 8.460 7.776 6.368 5.664 4.960 9.920 2.880 7.840 0.300 5.760 10.720 3.630	3 6 9 13 16 19 22 26 29 32 65 98 131 164 196 229 262	3.3708 6.7416 10.1124 1.4832 4.8539 8.2247 11.5955 2.9663 6.3371 9.7079 7.4158 5.1237 2.8316 0.5395 10.2474 7.9553 5.6632	200 300 400 500 600 700 300 900 2000 3000 4000 5000 6000 7000 3000 9000	102,61481 153,92222 205,22963 256,53704 307,84444 359,15185 410,45926 461,76667 513,07407 1026,14815 1539,22222 2052,29630 2565,37037 3078,44444 3591,51352 4104,59259 4617,66667	615 923 1231 1539 1847 2154 2462 2770 3078 6156 9235 12313 15392 13470 21549 227706	8 6 4 2 0 10 9 7 5 10 4 9 2 8 1 6 0	3.200 4.800 6.400 8.000 9.600 11.200 0.800 2.400 4.000 0.000 4.000 8.000 0.000 4.000 8.000 0.000	656 984 1312 1640 1968 2296 2624 2952 3280 6561 9842 13123 16404 19685 22966 26247 29528	2.1580 3.2370 4.3160 5.3950 6.4740 7.5530 8.6320 9.7110 10.7900 9.5800 8.3700 7.1600 5.9500 4.7400 3.5300 2.3200 1.1100
100	$\begin{bmatrix} 46.17667 \\ 51.30741 \end{bmatrix}$	277 307	10	8.640 1.600	295 328	$\begin{bmatrix} 3.3711 \\ 1.0790 \end{bmatrix}$	10000	5130.74074	20784	5	1.000	32808	11.9000

TABLE XII.—MILLIMETRES.

Mlllim.	Tolses. French lines.		English lines.	Millim.	Toises.	French lines.	English lines.	
1 2 3 4 5 6	0.00051 0.00103 0.00154 0.00205 0.00257	0.443 0.887 1.330 1.773 2.216	0.0394 0.0787 0.1181 0.1575 0.1969	60 70 80 90 100	0.03078 0.03592 0.04105 0.04618 0.05131	26.598 31.031 35.464 39.897 44.330	2.3622 2.7560 3.1497 3.5434 3.9371	
7 8 9 10 20 30 40 50	0.00308 0.00359 0.00410 0.00462 0.00513 0.01026 0.01539 0.02052 0.02565	2.660 3.103 3.546 3.990 4.433 8.866 13.299 17.732 22.165	0.2362 0.2756 0.3150 0.3543 0.3937 0.7874 1.1811 1.5748 1.9685	200 300 400 500 600 700 800 900	0.10261 0.15392 0.20523 0.25654 0.30784 0.35915 0.41046 0.46177	88.659 132.989 177.318 221.648 265.978 310.307 354.637 398.966	7.8742 11.8112 15.7483 19.6854 23.6225 27.5596 31.4966 35.4337	

TABLE XIII.—ENGLISH FEET.

Eng.	Toises.	Metres.	French			English	Toises.	Metres.	French		
			Fcet.	In.	Lines.	feet.			Feet.	In.	Lines.
1	0.15638	0.30479	0	11	3.114	200	31.27643	60.95850	187	7	10.836
2	0.31276	0.60959	1	10	6.228	300	46.91465	91.43835		5	10.254
3	0.46915	0.91438	2	9	9.343	400	62.55286	121.91780	375	3	9.672
4	0.62553	1.21918	3	9	0.457	500	78.19108	152.39725	469	1	9.090
5	0.78191	1.52397	4	8	3.571	600	93.82929	182.87670	562	11	8.508
6	0.93829		5	7	6.685	700	109.46751	213.35615	656	9	7.926
7	1.09468		6	6	9,799	800	125.10572	243.83559	750	7	7.344
8	1.25106	1	7	6	0,913	900	140.74394	274.31504	844	5	6.762
9	1.40744		8	5	4.028	1000	156.38215	304.79449	938	3	6.180
10	1.56382		9	4	7.142	2000	312.76431	609.58899	1876	7	0.360
20	3.12764	1 1	18	9	2.284	3000	469,14646	914.38348	2814	10	6.539
30	4.69146	9.14383	28	1	9.425	4000	625,52861	1219.17797	3753	2	0.719
40	6.25529	12.19178	37	6	4.567	5000	781.91076	1523.97246	4691	5	6.899
50	7.81911	15.23972	46	10	11.709	6000	938.29292	1828.76696	5629	9	1.079
60	9.38293	18.28767	56	3	6.851	7000	1094.67507	2133.56145	6568	0	7.259
70		21.33561	65	8	1.993	8000	1251.05722	2438.35594	7506	4	1.438
80		24.38536	75	0	9.134	9000		2743.15044	8444	7	7.618
90		27.43150	84	5	4.276	10000	1563.82153	3047.94493	9382	11	1.798
100	15.63822	30.47945	93	9	11.418			1			

TABLE XIV .- ENGLISH INCHES.

lnch.	Toises.	French		Millim.	Inch.	Toises.	French		Millim,	
		In.	Lines.				In.	Lines.		
1	0.01303	0	11.260	25.400	7	0.09122	6	6.817	177.797	
2	0.02606	1	10.519	50.799	8	0.10426	7	6.076	203.197	
3	0.03910	2	9.779	76.199	9	0.11729	8	5.336	228.596	
4	0.05213	3	9.038	101.598	10	0.13032	9	4.595	253.995	
5	0.06516	4	8.298	126.998	11	0.14335	10	3.855	279.395	
6	0.07819	5	7.557	152.397						

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